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GOVERNMENT OF INDIA

DEPARTMENT OF COMMERCE

REPORT OF THE
INDIAN TARIFF BOARD
ON THE
DRY BATTERY INDUSTRY

BOMBAY 1947

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REPORT ON THE DRY BATTERY INDUSTRY

Reference to the Board

1. The application of the dry battery industry for protection and assistance was referred to the Tariff Board for investigation and report by the Commerce Department of the Government of India in their Resolution No. 218-T (55)|45, dated the 12th October 1946, read with paragaphs 2 and 7 of the Commerce Department Resolution No. 218-T (55)|45, dated the 3rd November 1945. Initiative for the reference of the case to the Board was taken by Messrs. Estrela Batteries, Ltd., Bombay, who applied, in their letter No. M.372, dated the 1st June 1946, to the Commerce Department of the Government of India, asking for protection of the industry. The main grounds urged by the applicants in support of their claim for protection are :—

(i) the industry is essential to the defence and civilian requirements of the country both in war and in peace, as proved by the experience of the war just ended ;

(ii) the industry enjoys natural advantages in regard to production and marketing ;

(iii) the industry will be able to carry on successfully without protection or State assistance after an initial period of protection ; and

(iv) the industry was expanded in wartime with the specific encouragement of the Central Government.

The request of Estrelas has been supported by the Mahratta Chamber of Commerce and Industries, Poona, *vide* its letter, dated the 11th November 1946.

Terms of reference to the Board.

2. Under the terms of reference contained in the Resolution, dated the 3rd November 1945, the Board has to satisfy itself—

(1) that the industry is established on sound business lines ; and

(2) (a) that, having regard to the natural or economic advantages enjoyed by the industry and its actual or probable costs, it is likely within a reasonable time to develop sufficiently to be able to carry on successfully without protection or State assistance ; or

(b) that it is an industry to which it is desirable in the national interest to grant protection or assistance and that the probable cost of such protection or assistance to the community is not excessive.

Where a claim to protection or assistance is found to be established, *i.e.* if condition (1) and condition 2(a) or (b) are satisfied, the Board may recommend—

(i) whether, at what rate and in respect of what articles, or class or description of articles, a protective duty should be imposed ;

(ii) what additional or alternative measures should be taken to protect or assist the industry ; and

(iii) for what period, not exceeding three years, the tariff or other measures recommended should remain in force.

In making its recommendations the Board has to give due weight to the interests of the consumer in the light of the prevailing conditions and also consider how the recommendations affect industries using the articles in respect of which protection is to be granted.

Method of inquiry.

3. The Board issued a press communiqué on October 18, 1946, inviting all persons associated with this industry, including producers, importers and consumers, who wished their views to be considered, to submit their representations to the Board. Provincial Governments and Administrations were also addressed for their views on the application for protection. Lists of persons, associations or firms to whom our detailed questionnaires were issued and from whom replies or memoranda were received will be found in Appendix I. Mr. C. C. Desai and Dr. H. L. Dey, Members of the Board, visited the Estrela Works at Bombay on the 18th April 1947. The Technical Adviser attached to the Board visited the same factory on the 13th March 1947, and the Cost Accounts Officer and the Deputy Secretary to the Board on the 11th April 1947. The factory of Messrs. Baroda Batteries, Ltd., Baroda, was visited by the Technical Adviser and the Cost Accounts Officer in connection with this inquiry on May 4, 1947. Oral evidence of producers, consumers and importers was taken at Ootacamund on the 9th and 10th June 1947. A list of the witnesses examined is given in Appendix II.

History of the industry.

4. The first factory for the manufacture of dry batteries in India was set up by the Ever-ready Company of U. K. in 1926 at Cossipore, Calcutta. The factory was later acquired by the National Carbon Co., of U.S.A. in 1936. For some time production continued in the old factory, but a completely new plant was installed in 1941 with a very much larger output. Estrelas were the first Indian firm to undertake production of dry batteries. They actually commenced production in 1936 under the name of Jesco Chemical and Allied Industries, but they did not make much headway. The firm was then reorganised under the name of Messrs. Estrela Batteries, Ltd., and registered as a public limited company by the end of 1939. They manufacture mainly dry batteries, the production of storage batteries being one of their side activities. The pre-war capacity, as well as production, of the Indian industry was roughly 18 million cells per annum. During the war period, the demand for batteries from the defence services increased considerably and was met almost wholly from indigenous production which had to be expanded very substantially. In 1942 the factory of the National Carbon Company was placed under the statutory control of the Director-General of Munitions Production and its production was expanded by putting up new assembly lines and by working longer hours. Similarly, Estrelas were also brought under Government control and their entire output was taken over by Government. Government assisted Estrelas in procuring a completely new plant and erecting the same at a new site in Bombay in order to meet the very heavy demand forecast by the defence services. The war, however, came to an end before the factory was fully established ; and, in fact, it is only recently (January 1947) that production has commenced in the new factory of this firm. Even now,

all the machinery has not been received or installed, some having been lost in transit on the way, and the work of construction and completion of the plant is still in progress. There are also some other firms producing, or having machinery to produce, dry batteries on a small scale, at Baroda, Bangalore and Lahore, but the bulk of the production comes from National Carbon in Calcutta and Estrelas in Bombay. The capacity of the Indian industry has been expanded from 18 million cells per year before the war to 132 million cells per year now. Both National Carbon and Estrelas have under consideration plans for expansion and installation of some additional automatic machinery which would still further raise their output as also the total Indian production. A complete list of the known producers of dry batteries with the productive capacity as declared by them and with the actual output during a period of twelve months is given in Appendix III. The magnitude of the industry, as it stands today, can be judged from the following facts :—

(a) capital of roughly Rs. 38 lakhs is employed in it ;

(b) the value of the goods produced per year amounts to nearly Rs. 180 lakhs ; and

(c) it employs 2,500 workers.

Uses.

5. Dry cells and batteries are of several kinds and are used mainly for the following purposes :—

(1) *Civil* :

(a) flash lights ;

(b) radio sets ;

(c) electrical appliances and medical instruments ; and

(d) posts and telegraphic equipment.

(2) *Military* :

(a) Army and Navy signalling ;

(b) field telephones ;

(c) army operational radio sets ; and

(d) aircraft communication sets and instruments.

Dry batteries consist of one or more cells connected, in series and/or parallel, to give the required voltage and current. The number of sizes of individual cells is only about half a dozen, but there is a very large number of different types of batteries consisting of different combinations of various cells. The voltage of a unit cell is 1.5 volts and the output of the current depends on the size of the cell. Basically, dry batteries are consumers stores. In peacetime, by far the greater percentage of cells manufactured are used in torches and flashlights. The industry laid special stress on the fact that a dry battery is a household article, the use of which is becoming increasingly popular in rural areas. In war-time dry cells are assembled and made into all kinds of batteries required by the defence services, especially in communications and signalling.

Raw materials.

6. A dry cell comprises mainly three components, *viz.*, (i) dolly material, (ii) electrolyte material and (iii) containers, caps and connecting strips. The dolly materials are mang-

anese dioxide (natural and artificial) used as depolariser, graphite (natural and artificial) used as electrical conductor, carbon rod as electrode, and acetylene soot or lamp-black as porosity agents. Electrolyte materials consist of chlorides of ammonium, zinc, calcium, magnesium, and mercury, of high purity, used singly or in combination, and wheat flour and starch as gelatinising agents. Containers, caps, and connecting strips are made from zinc and brass sheets. Solder flux, sealing compound, wrapping cloth, cotton thread, and cardboards are the other accessories. The quantities of raw materials required in the manufacture of, say, 1000 standard cells (1.5 volts and 1-3/8-in. × 2-3/8-in.), according to Estrelas, are as follows :—

Serial No.	Raw material.	Unit.	Estimate of Estrelas	Estimate of a research worker of the Council of Scientific and Industrial Research.
		Lbs.		
1	*Manganese dioxide	,,	33 (S. African)	80 (Indian)
		,,	22 (Indian)	7-10 (Artificial)
2	*Graphite (natural)	,,	10·5	17-20 (graphite and/or lampblack)
	Do. (artificial)	,,	4·95	
3	*Lampblack	,,	1·98	
4	*Carbon	Pcs.	1000	1000
5	*Zinc sheets	Lbs.	42	55
6	*Ammonium chloride .	,,	20·92	15·20
7	*Zinc Oxide	,,	1·1	
8	*Zinc chloride	,,	1·87	4·5
9	*Calcium chloride ..	,,	0·33	1
10	*Mercury chloride ..	,,	0·088	0·5
11	Wheat flour	,,	3·69	3·4
12	*Brass caps, 8 mm ..	Lb.	0·7	2
13	Voile cloth (46″ wide) ..	Yards	6	
14	Yarn (3/20's) .. .	Lbs.	0·5	
15	Paraffin wax	,,	2	
16	Rosin	,,	3·8	10—15
17	Mexphalt	,,	3·5	
18	Barytes	,,	5	
19	Lime	Lb.	0·2	
20	*Solder	Lbs.	1·5	
21	Distilled water	,,	..	25
22	Paper of various sizes and specifications	..	..	
23	Packing material ..	..	..	

*(Implies imported raw material.)

In the statement above, we also give the quantities of raw materials that should be used in the manufacture of 100 standard cells according to a research worker of the Council of Scientific and Industrial Research, who has carried out exhaustive work on the subject, including the economics of the industry. It will be observed that the raw materials required at present to be imported for the production of dry cells in India are many and important : but, firstly, this is also the position of the dry battery industry in certain other countries where the industry has been established and is being protected, and, secondly, dependence on imported raw materials will diminish as production of batteries is expanded in India and research on the indigenous raw materials is intensified alongside the progress of this industry. In this connection, it is interesting to note that Messrs. Baroda Batteries, Ltd., are not using any imported manganese dioxide, which is one of the most important raw materials for this industry, but employ, as depolariser, activated manganese dioxide, processed by themselves from indigenous ore. India is, of course, one of the leading countries producing manganese ore. Some 29 samples of Indian ores from various mining districts were examined under the aegis of the Industrial Research Bureau for their efficiency as dry cell depolarizers and compared with foreign ores, and about half a dozen have been found to be quite satisfactory. The use of the Indian manganese dioxide can, therefore, be commended to the manufacturers of dry batteries and dry cells in India. Some of the manufacturers stated that they agreed with this suggestion provided that research was continued with a view to securing still better results. The Council of Scientific and Industrial Research would, it was stated, be the proper body to undertake and continue this research. Mr. Farrell of National Carbon revealed that his factory was also experimenting on a number of samples of Indian ores but his conclusion was that unless proper milling or grinding machinery is installed, the Indian ore could not be used and could not replace the American material. Similarly, carbon electrodes, which are at present imported, can, and are likely to, be manufactured from raw materials available in the country in the near future. Estrelas are putting up a carbon electrode plant in order to reduce their costs. According to Mr. Jerlekar of the C.S.I.R., the Indian graphite could be processed and developed and made suitable for use in the Indian battery industry. Some factories have endeavoured to use indigenously rolled zinc but this has not proved satisfactory. Estrelas are putting up a plant for the rolling of zinc and extrusion of zinc cans which should give satisfactory results in regard to both the quality of cells and the quantity of production. We have tried to work out roughly the percentage of value of indigenous and imported raw materials in the case of Estrelas, and the figures are as follows :—

Raw materials imported	.. ..	71 per cent.
Raw materials indigenous	.. ..	29 per cent.

The corresponding Australian figures taken from the Australian Tariff Board report on dry batteries, dated 3rd November 1930 are given below for purposes of comparison :—

Raw materials imported	.. ..	52 per cent.
Raw materials indigenous	.. ..	48 per cent.

We found that National Carbon were importing a yet larger proportion of raw materials and justified this action on the ground that they would not in any case like their quality to suffer as a result of their using Indian materials. Their proportion of imported materials is stated to be something like 85 per cent. as compared with 71 per cent. in the case of Estrelas. Mr. Farrell explained that his firm was anxious to use Indian materials and was experimenting on them, but had so far not been successful in replacing imported raw materials. He stressed that utilisation of Indian raw materials was desirable from the point of view of both economy and self-sufficiency.

Process.

7. Manganese dioxide, graphite and lampblack are mixed in rotating drums and the mixture is wetted with a small quantity of electrolyte and is pressed into dollies of required sizes with carbon electrodes in the centre. Each dolly is wrapped with gauze cloth and tied with thread. The dollies are inserted into individual zinc cans, wherein paraffined star-shaped cardboard is previously inserted at the bottom in order to insulate the dolly from the zinc can. Electrolyte containing starch is then poured into the cans up to the required level and is gelatinised by heating. The sealing compound is poured into the containers with the help of a washer. The carbon protrusion on the top is thereafter mounted with a brass cap. The cell is now ready, with capped carbon as the positive pole, and the zinc can as the negative pole. The cell is finally wrapped with a paper tube and labelled. High tension batteries are made by soldering the cells in series, *i.e.*, the positive of one cell to the negative of the other, the number of cells so connected depending upon the voltage required. The whole block is wrapped with insulating paper and the top portion is sealed with a sealing compound. Estrelas are at present using rolled zinc cans, but when their extrusion plant is installed, extruded zinc cans will be employed. They are also experimenting on the elimination of the wrapping of dollies and the development of a special type of layer-built battery which is now coming into vogue. Except National Carbon, the other producers are using machinery and processes involving manual handling, the result of which is both to raise costs and to lower quality ; they are, however, contemplating to substitute the present equipment by automatic machinery, and when this is effected, the industry should be in a much more favourable position to meet competition from abroad and to overcome prejudice against the locally-made battery.

Estimated Indian demand.

8. The pre-war Indian demand of dry cells can be determined by adding the local production of 18 million cells at the time to the figures of imports. The import figures unfortunately are available in terms of value rather than of cells. Taking the number of cells roughly at 10 for a rupee in prewar days, which ratio was agreed to at the public inquiry, and taking the prewar annual import value at approximately 22 lakhs, the total quantity of dry cells imported can be estimated at roughly 22 million per annum. The total prewar Indian demand is thus estimated at approximately 40 million cells per annum. During the last three years, the annual consumption was practically the same as the quantity produced in the country, the imports of dry cells into India being negligible. In 1944,

the production and, therefore, the home consumption was 101 million cells approximately 80 per cent. of which was taken by the defence services only. As for the future demand, the different interests present at the public inquiry agreed that, regard being had to the general rise in the standard of living and greater industrialisation, the estimate towards the end of the next three years may be put at 150 million cells per annum, valued at about Rs. 250 lakhs. The Government demands declined from 80 per cent. in 1944 to 40 per cent. in 1946, and this proportion of the State demand will further decrease as, on the one hand, the Government requirements drop to peace-time levels, and, on the other, consumption by the civilian population increases *pari passu* with the progress, industrialisation and general development of the country. It is reported that at present the proportion of Government to civil requirements is 25 to 75, but there is a possibility of the Government offtake rising to 30 per cent. due to the Defence Department requirements going up, as mentioned by the representative of the Director General of Industries and Supplies present at the inquiry. The Committee appointed by the Bombay Government to go into the possibilities of industrial development in that province, estimated the Indian requirements of dry cells at 500 million cells per year for the next five years, but this is regarded by us as a gross over-estimate.

Domestic production.

9. As stated before, the total pre-war domestic production was to the extent of about 18 million cells per annum. With the production of the National Carbon Company, Calcutta, with their new plant and with the expansion of Estrelas, the total production rose in 1944 to 101 million, National Carbon being responsible for over 75 million and Estrelas for about 26 million. The total production in 1946 was 87.97 million cells, made up by the National Carbon output of 71.4 million, the Estrela output of 16.25 million and the Baroda Batteries output of aproximately of 0.32 million cells. The production in the first four months of 1947 is National Carbon 26.02 million, Estrela 5.46 million and Baroda Batteries 0.04 million, total 31.52 million cells. If this rate of production is maintained, the total output in 1947 should be 94.56 million cells, which is a definite improvement on the production achieved in 1946. The total rated capacity of the Indian industry is very much more, being 132 million cells at present. This capacity is expected to rise to 142 million cells by the end of 1947 and 185 millions cells by the end of 1948. The break-up of these estimated capacities is given below :—

	Existing capacity (In million cells.)	Capacity by end of 1947. (In million cells).	Capacity by end of 1948. (In million cells.)
N. C. C., Calcutta	100·0	100·0	120·0
Esterla, Bombay	30·0	40·0	40·0
Baroda Batteries, Baroda ..	2·0	2·0	2·0
Jamestone Eng., Bombay	..	..	15·0
Kaycee Industries Ltd., Lahore ..	..	..	5·0
Amco, Bangalore	..	..	3·0
	132·0	142·0	185·0

Production is not up to full rated capacity despite demand for the goods in the country, because of difficulties in the supply of raw materials and transport. As we have estimated the total annual Indian demand for the next three years at 150 million cells, it is clear that the domestic production in the same period is likely to be more than sufficient to meet the entire Indian demand under normal conditions and that there is even scope for internal competition, the advantage of which should go in the long run to the Indian consumer. These figures also indicate the scope for future export in the case of this industry.

Quality of the indigenous product.

10. We consulted a number of firms which have had occasion to use both imported and indigenous cells and also discussed the question of the quality of the indigenous product at the public inquiry. The consensus of opinion is that the Indian product compares favourably with the imported cells. But in the early days of the establishment of the industry in India, there was cause for complaint. It is agreed that the quality has steadily improved and is now almost as good as that of the imported product. Dodge and Seymour, Bombay, an American firm of importers say, for instance, that the imported U.S.A. battery was superior to the indigenous product, but the manufacturing processes of the indigenous product have improved to such an extent that the Indian made battery now compares favourably with the U.S.A. product. Another importer and large consumer of batteries, the Chicago Telephone and Radio Company, Ltd., of Bombay says that there were complaints about the locally made batteries when they were first manufactured, but the quality has steadily improved and that today it comes very near to the imported batteries. Estrelas emphasise that their products are tested to British Standard specifications as also to the Indian Army specifications. The two defects to which attention has been drawn by some importers and consumers are that the shelf life of the Indian batteries is not as good as that of the imported batteries, and that the performance of the Indian batteries is not uniform. One firm of importers which took great pains in preparing its memorandum for presentation to the Board points out that under different climates and under ordinary storage facilities in the retail shops, the home-made products lack the keeping properties of the imported batteries. We put these complaints specifically to the Indian manufacturers. They explained that the keeping property will improve with better raw materials becoming available in the post-war period. The flaw regarding lack of uniformity in performance will disappear with the elimination of manual handling in the preparation of dollies when automatic machinery is installed. It was agreed that the defects were not such as to justify a conclusion that it is not possible to make in India dry batteries of comparable quality, or that the Indian industry suffers from an inherent handicap on this score. The manufacturers concerned will also make every effort to remove this cause for dissatisfaction and to put on the market a product equal to, if not better than, the imported product, as production develops, facilities for equipment and raw materials improve and more attention is paid to experiment and research. If the Indian manufacturer produces a battery equal in quality with the imported one, this particular characteristic of dry batteries. *i.e.*, deterioration on storage, will be an advantage to the Indian

industry owing to the shorter lead between the producer and the consumer, and a serious handicap to the imported product.

Cost of production and fair selling price.

11(a) To determine the measure of protection necessary to safeguard the Indian industry, it is our practice to compare the fair selling price of the Indian industry with the landed cost of imports of comparable goods from the principal competing country. Ordinarily, we cost at least two factories so that we are able to compare the two sets of results and see where economies are possible and what should be the minimum cost of production of a unit running on economic lines and with more than average efficiency. In the present case, we should have costed both National Carbon at Calcutta and Estrelas in Bombay, but the former refused to afford us the costing facilities on the ground that they were not applying for or in need of protection so long as there was a reasonable revenue duty. Our costing was, therefore, confined to Estrelas in Bombay.

(b) We were told by both the major producers that an economic battery manufacturing unit should have a capacity of about 15 million cells per year. Estrelas with their capacity for 30 million cells satisfy this condition.

(c) We selected four representative cells for the purpose of costing, *viz.*,—

(1) standard cell (Estrela type No. 112),
(2) baby cell (Estrela type No. 113),
(3) tube battery (Estrela type No. 114), and
(4) flat battery (Estrela type No. 111).

Of these, the standard cell is the most popular type, accounting for about 40 per cent. of the total Estrela production and over 60 per cent. of the total imports of dry cells in the country before the war. It has been confirmed at the inquiry that the standard cell is the most representative type of dry cell for the purpose of this case.

(d) The costing carried out by our Cost Accounts Officer pertained to the year ending 31st March 1946, as latest complete accounts were available for that period. It has been verified that costs for 1946-47 are about the same as for 1945-46. We based our estimate of cost for 1947-48 on the results of the year 1945-46, subject to such modifications as are required by the fact that although in 1945-46 the output was 17 million cells, the costing for 1947-48 should take into account production of 27 million cells.

(e) Estrelas did not want the details of cost of production to be included in our report which would be published. They have of course no objection to the overall figures being included in the report. (Details of cost of production are therefore shown in a separate confidential appendix (Appendix V.))*

(f) We discussed the cost of production figures with the representative of the Company *in camera* at the public inquiry and have determined the fair selling price of the standard cell (Estrela type No. 112) to be Rs. 230.25 for a thousand cells. This fair selling price includes cost of

*Excluded from this report, being confidential.

production, profit at 10 per cent. on the block capital, freight disadvantage of Rs. 2-8-0 per thousand cells, and premium for prejudice against the Indian product amounting to Rs. 20|- for a thousand cells. We may explain that the freight disadvantage has been allowed on the basis of half the railway freight between Bombay and Calcutta and for half the output of the Company. The Company wanted an allowance of Rs. 5|- for a thousand cells, but this was considered by us to be too high. Even Rs. 2-8-0 is on the liberal side, but we have agreed to the figure, as we were impressed by the contention of the firm that for building up the future market, it must despatch some of the goods even to places as far as Calcutta, Madras and Karachi. Similarly, we have given a fairly liberal allowance for premium on prejudice in view of the fact that the Indian product does suffer from prejudice, which is common to all new enterprises, and that without this allowance, Estrelas will not have a chance of standing in competition with imported products with an established reputation. The idea underlying the premium for prejudice is that the producer must pass on the benefit of it to the consumer so that his product is cheaper than the imported product, thus trying to neutralise the preference for the foreign article with the offer of a lower price.

(g) We could query some items of expenditure such as stationery, printing and postage, but we have not done so, because the effect of any such reduction on the total cost will not be substantial. We, however, bring this fact to the notice of the firm so that every effort may be made to reduce expenses and to lower costs by the time of the expiry of the period of protection which is recommended by us later in the report.

(h) Working capital has been taken as three months average cost of production, and interest has been allowed on it at 4 per cent. per annum. On this basis, the interest works out to 1 per cent. on cost. Similarly, we have allowed 10 per cent. on the block capital by way of profit, which works out to 1.83 per cent. on cost.

(i) We must pay a tribute here to the Company's accounting system. The Company has got a well-established cost accounting system and separately maintains all the cost data necessary for working out the cost of production of the various types manufactured. Annual reconciliation is also effected between the cost and financial figures. Raw materials are issued to production on the basis of a standard formula, which is reviewed from time to time. Labour is booked separately in respect of each type of manufacture. Allocation of factory, office and administration overheads is made to the different types of finished products on the basis of factory costs.

(j) Our estimate of the cost of production for 1947-48 takes into account production mostly with the old machinery. We have not been able to ascertain the cost of production as it would be when the automatic machinery is in use. The new machinery is not likely to be in full production before July 1948, if the present time table is adhered to. It is clear that we shall not have reliable cost data before early 1949 in respect of the new plant. The cost of production should go down when the new plant is in full working order and is operating under optimum conditions. There should therefore be a fresh costing some time in 1949

with a view to determining what the protection should be after 1st April 1949.

(k) For the purpose of determining protection the fair selling price of the Indian product will be taken to be Rs. 230.25 per thousand standard cells. National Carbon's ex-factory prices are Rs. 185 per thousand standard cells, but we have based the case for protection on the cost of Estrelas ascertained by us after a detailed cost accounting.

(l) The statement below shows the relationship of the various items which are comprised in the fair selling price in the case of standard cells. It also shows comparable Australian figures taken from one of the Australian Tariff Board reports on the industry.

Items (1)	Actuals of cost per 1000 standard cells. (2)	As a percentage of total. (3)	Australian figures comparable with the percentage given in column (3) (4)
	Rs.		
Materials—imported	77·25	33·6	26
do. local	31·42	13·6	24
Labour	18·01	7·8	16
Overheads	79·79	34·7	19
Manufacturers' profit	3·78	1·6	15
Prejudice	20·00	8·7	..
Total ..	230·25	100·0	100
Retail selling price ..	244	106	..

Imports.

12. Imports of dry batteries are shown in the annual statements of Sea-borne Trade under two separate sub-heads, namely, (1) "Batteries for flash lamps" and (2) "Batteries other sorts". The sub-head "Batteries for flash lamps" relates mainly to dry batteries whereas the second sub-head includes special types of batteries used for purposes other than flash lamps. It will be seen from the statistics that most of the imports are under the sub-head "Batteries for flash lamps", imports under the other sub-head being relatively small. It will also be observed that there were practically no imports of dry batteries during the war years, the requirements of the country being met from indigenous production. The statistics taken from Sea-borne Trade returns (Appendix IV) give imports in value and not in unit cells. A perusal of the statements in the Appendix will show that, in so far as flash lamp batteries are concerned, U.S.A., was the country from where the bulk of our imports came. Germany

stood second in this matter, followed by Hong Kong, U.K., and Japan. It was stated at the public inquiry that U.S.A. would be our principal competitor in the next two or three years in regard to volume of import, as also landed costs as will be shown later in the report. Germany and Japan are out of the picture for the purpose of trade in this commodity for some time and Hong Kong's capacity for exporting cheap batteries as in pre-war days seems to have been seriously affected in wartime.

Customs duty.

13. Dry batteries and dry cells are included in item 73(2) of the First Schedule to the Indian Tariff Act, XXXII of 1934, for purposes of customs duty. The relevant extract from the Indian Customs Tariff (Twenty-seventh Issue) is reproduced below :—

Item No.	Name of article.	Nature of duty	Standard rate of duty	Preferential rate of duty if the article is the produce or manufacture of		
				The United Kingdom.	A British Colony.	Burma
	SECTION XVI— *Machinery and apparatus: Electrical material—*					
73(2)	The following Electrical Instruments, Apparatus and Appliances, namely, telegraphic and telephonic instruments, apparatus and appliances not otherwise specified, flash lights, carbons, condensers and bell apparatus, and switch boards designed for use in circuits of less than ten amperes and at a pressure not exceeding 250 volts, also accumulators, batteries and electro-medical apparatus.	Revenue	30% *ad valorem*		..	12½% *ad valorem.*

C. i. f. prices.

14 (a) As explained in paragraph 11 dealing with the cost of production of the Indian industry, we have selected standard cells for purposes of comparison of domestic costs with foreign prices it being agreed that whatever measure of protection is indicated by this comparison will be suitable for the other types of dry cells.

(b) The table below gives c.i.f. prices and landed costs of 1000 standard cells from 1936 to 1939, indicating also the different landed costs for the different countries of consignment :—

Landed costs and selling prices of 1000 standard cells in pre-war years.

Year to which the figures relate	Country of origin.	C. i. f. price Indian port	Duty*	Clearing and other charges	Total landed cost	Retail selling price
		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1937 ..	China	20 13 4	(30%) 6 4 0	0 11 0	27 12 4	31 4 0
1938-39	U. S. A.	112 8 0	(25%) 28 2 0	2 8 0	143 2 0	152 8 0
	Germany	115 0 0	23 12 0	2 8 0	146 4 0	155 0 0
	Hongkong	30 0 0	7 8 0	2 8 0	40 0 0	45 0 0
1939 ..	Germany	83 10 0	(30%) 25 1 0	3 4 1	111 15 1	130 4 0
1936-39	U. S. A.	110 0 0	(30%) 33 0 0	2 3 0	145 3 0	151 4 0
	Hongkong	33 2 0	9 15 0	0 10 0	43 11 0	44 6 0
	Germany	111 14 0	33 9 0	2 3 10	147 10 10	155 0 0

*Previous to 27th May 1939, dry batteries were classified under "Electrical Instruments, Apparatus and Appliances, not otherwise specified", having a standard duty of 30% and preferential duty of 25% *ad valorem*. After this date, they were classified separately with a standard revenue duty of 25% *ad valorem*, which was subsequently increased to 30% *ad valorem* from 26th March 1947.

(c) The table below gives the latest c.i.f. prices and landed costs of 1000 standard cells, as collected from customs authorities and some principal importing firms :—

Country of origin	——	C. I. F.	Duty @ 30% *ad valorem*	Clearing & other charges	Total landed cost
		Rs.	Rs.	Rs.	Rs.
CSA·U	(1) Figures supplied by Collector of Customs, Madras.	187·5	56·25	5·00	248·75
	(2) Figures supplied by an importer.	198·75	59·62	5·96	264·33
Hong-Kong	(1) Figures supplied by Collecter of Customs, Bombay.	160·00*	48	4·8	212·8
	(2) Figures supplied by an importer.	212·63	63·79	6·38	282·80

*The Collector of Customs, Bombay, has given the c.i.f. price as Rs. 160 for 1000 standard cells from Hong Kong for January 1947, but he has also stated that this price should not be regarded as representative as it was obtained from prices of samples or no-charge items and not from regular invoice values.

(d) An analysis of the pre-war and present c.i.f. prices and landed costs shows that before the war Chinese batteries were very much cheaper than those received from the other countries, whereas the position is different at present. Even if we were to take the figures supplied by Collector of Customs, Bombay—which he warns us not to rely on—the difference between the landed costs of the Chinese batteries and the American batteries is not much. It was agreed at the inquiry that for some time to come at least, U.S.A. should be treated as the principal competing country, and that the measure of protection required for the Indian industry should be based on the competition offered from U.S.A. rather than from Hong Kong. We shall, therefore, take the figure of Rs. 248.75 as the landed cost of 1000 standard cells for the pupose of determining what measure of protection would be necessary in the case of the Indian dry battery industry.

(e) Estrelas produced a quotation showing the c.i.f. price of comparable standard cells from America as Rs. 166.4 which would give a landed cost of Rs. 218. We cannot accept this figure as it is a quotation and not the actual landed cost. We also felt that Estrelas had under-estimated the insurance and freight charges in working out the landed cost. In any case as we have linked our recommendation for protection with action under section 4(1) of the Indian Tariff Act for automatic adjustment of duty, a sufficient assurance to the industry has been provided against lower landed costs undermining its position in future.

Industry's requests for protection and assistance.

15. The industry's requests for protection and assistance may be summarised as under :—

(a) imposition of a protective duty of 100 per cent. on all descriptions of dry cells and batteries ;

(b) period of protection to be ten years in the first instance ;

(c) remission of duty on imported basic raw materials and reduction in the prices of other materials controlled by Government, *e.g.*, zinc ingot, ammonium chloride, and acetylene soot ;

(d) batteries manufacturing machinery to be allowed to be imported duty free ;

(e) extension of Government patronage to Indian-owned companies ;

(f) encouragement of research by Government by subsidy and other means ; and

(g) National Carbon should be asked to mark their Indian products as " Made in India ".

Measure of protection

16. (a) We have shown in paragraph 11 that the fair selling price in respect of which the Indian producer should be protected is Rs. 230.25 for a thousand standard cells. We have assumed in paragraph 14 that the c.i.f. price of imports from the principal competing country is Rs. 187.50 for a thousand standard cells of comparative type. The clearing and handling charges calculated at approximately 2 per cent. of the c.i.f. comes to Rs. 5 per thousand standard cells. The landed

cost ex duty would thus come to Rs. 192.5 for a thousand standard cells. The difference between the fair selling price of Rs. 230.25 and the landed cost ex duty of Rs. 192.50 comes to Rs. 37.75, which represents the duty necessary to place the Indian producer on terms of equality with imports in so far as the price factor is concerned. The sum of Rs. 37.75 represents 20.1 per cent. of the c.i.f. Rs. 187.50. A duty of 20 per cent. will thus be sufficient just to protect the Indian producer. The present duty is 30 per cent. *ad valorem*. We are satisfied that the Indian industry must be protected as there is a possibility of imports coming from abroad to its detriment. We are told by Mr. Farrell that American capacity has been very considerably expanded during wartime and is now far in excess of the American demand with the result that the surplus production will soon be seeking export markets. There is also the possibility of import of dry cells from China and the United Kingdom at competitive prices. The period of protection should be the period ending March 1950, which cannot be curtailed without impairing the sense of security intended to be conveyed to the industry through protection. Since we have come to the conclusion that the industry requires to be protected and since we are not recommending any other form of assistance, we feel that the existing 30 per cent. duty should be allowed to continue and be converted into a protective duty to remain in force till the 31st March 1949. In recommending the retention of the 30 per cent. duty, we are fully aware of the possible consequences. The fair selling price of Estrelas as determined by us is Rs. 230.25 per 1000 cells. In this fair selling price we have made ample allowance for all factors including that of prejudice. The landed cost, inclusive of duty at 30 per cent. will be Rs. 248.75 per 1,000 cells. If Estrelas aim at taking full advantage of the duty, they can increase their selling price to Rs. 248.75 and thus make an extra profit of Rs. 18.50 per 1,000 cells. This extra profit they will not be entitled to on the basis of their fair selling price including allowance for prejudice. Notwithstanding this temptation for Estrelas, we expect that they will not avail themselves of a fair selling price over and above what we have considered necessary as the price policy of National Carbon will be an effective check on any such tendency on the part of Estrelas. We have been told that, notwithstanding the existing duty of 30 per cent. *ad valorem*, National Carbon are selling their products at Rs. 185 per 1,000 standard cells. Mr. Farrell, the representative of National Carbon, told us at the inquiry that it was not the policy of his company to take advantage of the duty and raise the price. They are satisfied that their increased output and turnover are giving them ample profits and they do not intend to raise their selling price beyond their present rice of Rs. 185. We have no reason to doubt the *bona fides* of this assurance. We, therefore, feel confident that National Carbon also will not take advantage of the landed cost worked out on the basis of a 30 per cent. *ad valorem* duty. After the 31st March 1949, the rate of duty necessary to protect the industry should be determined in the light of cost data of Estrelas working the new automatic plant. The cost of production of Estrelas will, according to our recommendation, come for review early in January 1949.

(b) If the c.i.f. price of any substantial volume of imports falls below Rs. 173 per thousand standard cells, the landed cost will be less than

Rs. 230, thereby threatening the protection recommended by us. We would, therefore, recommend that, should the c.i.f. price of any substantial volume of imports from any country fall below Rs. 173 for thousand standard cells during the period ending March 1949 the duty should be revised under Section 4(1) of the Indian Tariff Act so as to raise the total landed cost to Rs. 230 per thousand standard cells in order to maintain the measure of protection intended by us.

(e) We have recommended a higher rate of duty than is warranted by the minimum needs of the industry because we felt that in the initial period the indigenous industry must be allowed a certain amount of cushion for adjustment of prices in relation to landed costs. We must, however, emphasise that the industry must reduce its costs and lower its prices, so that, taking advantage of the cushion provided, it ingratiates itself in the favour of the consuming public and wears down the prejudice against which it has to contend. We are glad to observe that the industry is alive to this requirement as also to the desirability of standing on its own legs at the end of the period of protection now recommended and that it will not under the shelter of protection either inflate its prices or relax in experiment and research as also in the drive to replace imported with indigenous raw materials.

Other forms of assistance to the industry.

17. (a) We have disposed of requests (a) and (b) referred to in paragraph 15 of our report. The third request is remission of duty on certain raw materials which are at present imported. We are not in favour of this suggestion for various reasons. Firstly, we are not satisfied that the import of most of the raw materials, which are at present imported is altogether unavoidable.

Secondly, research has shown that some of these raw materials, *e.g.*, manganese dioxide and graphite, can be made available in the country, and can be used after a certain amount of processing. We do not also see why it should not be possible to manufacture chemicals like zinc chloride and ammonium chloride in the country. In fact, calcium chloride is made in the country as also a certain amount of zinc chloride. Thirdly, any concession in the matter of rebate of duty on raw materials will have to be extended to National Carbon also, who are not in need of this concession and to whom the grant of concession would only serve to inflate their profits. Lastly, when the overall cost of dry batteries is more than covered by the existing duty of 30 per cent. which we propose to continue, there is no reason why the duty on raw materials should be waived, and an attempt made to reduce the indigenous costs, particularly when the raw materials are such as are used not only by this industry but by a number of other industries. We explained these reasons to the producers, and they agreed not to press their request for rebate in customs duty on the imported raw materials.

(b) The industry requests that battery manufacturing machinery, which is not at present manufactured in the country, should be allowed to be imported free of customs duty. This request is in conformity with the principle which the Board has followed in almost all other cases

previously. Actually, there is not much manufacturing machinery which is likely to be imported in the near future, but whatever is imported should not be required to bear customs duty. We recommend that the customs duty, which is at present 10 per cent. on battery manufacturing machinery should be refunded in respect of machinery to be imported hereafter.

(c) Estrelas request that purchases on behalf of Government and quasi-Government institutions should be made only from Indian-owned concerns in India. Such a request involves discrimination against another producer in India, a producer who was assisted by Government in setting up a completely new plant in wartime to help in the procurement of Defence Service requirements. It would be improper to discriminate against such a firm notwithstanding the fact that the firm is at present cent. per cent. foreign-owned. We, however, see the force of this request on the part of the Indian producers and hope that the same will not be lost on the management of National Carbon, who should take early steps to satisfy Indian opinion on the point. We had some discussion on this subject with Mr. Farrell of National Carbon, and he gave us to understand that his Company has considered and is still considering a suggestion to throw open a part of their share capital to investors in India, to have Indian Directors on the Board and to train up Indian technical personnel so that in course of time the factory in India is managed by Indians although the control, may, especially in technical matters, vest in National Carbon. In this matter, National Carbon are thinking on right lines, and all that we need say is that the consideration of the suggestion should be expedited and that final action on the part of the Company should be in step with the latest political and economic developments in India.

(d) The industry rightly stressed the necessity for continuance of research and its expansion. In this connection, we found that the research carried out by the Council of Scientific and Industrial Research had not received the response and co-operation from the Indian producers which it deserved. The Council's predecessor published a bulletin on dry cell manufacture in 1939, but Mr. Farrell was unaware of it ! Estrelas have purchased patent rights for the processing of manganese dioxide and production of carbon rods, but very little progress has been made in actually utilizing the results of research. On the other hand, we found that the Council of Scientific and Industrial Research was not taking advantage of the possibility of testing the results of research on a commercial scale with the co-operation of National Carbon. We thus noticed a lack of co-ordination between research on the one hand and commercial production on the other. With a view to avoiding such contingencies in future, it was suggested that battery manufacturers in India should form themselves into an Association, which would be able to maintain liaison with the Council of Scientific and Industrial Research in a much more effective manner and with results satisfactory to all concerned. We commend this suggestion to the Indian producers, including National Carbon, who as the major producer should take a lead in the matter and do everything possible to promote common interests without being involved in the necessity of divulging the results of individual research or trade secrets. Some

of the functions which may be carried out by the Association should include (1) distribution of published technical information to the members, (2) sponsoring all research work of common interest, especially on raw materials, and (3) maintenance of a special section either in the Council of Scientific and Industrial Research or in the National Chemical Laboratory, when it is established to carry on research work on the dry cell industry.

(e) The Indian producers pointed out that while their products were being labelled 'Made in India', National Carbon's products made in Calcutta were not labelled so as to show that they too were made in India. As a result, ignorant customers assumed that the Eveready cells made by National Carbon at Calcutta were made in America and preferred them to other cells like Estrela made in India. It was, therefore, suggested that National Carbon should be asked to see that their labels clearly showed that their Eveready cells were made in India. Mr. Farrell on behalf of National Carbon argued that whether their cells bore the label 'Made in India' or not, they would find equally ready market, because the public knew that the Eveready cell was a quality product. He had no particular objection to printing 'Made in India' on his cells, but pointed out that this would cause him inconvenience as some of his cells were intended for export to other countries, where they are interchangeable with goods supplied by some other National Carbon factories in the adjoining countries. He also argued that when there was no law requiring such printing on Indian products, there was no reason why National Carbon should be singled out for differential treatment. We are not aware of the reasons why there is no provision in the country requiring products made locally to be marked 'Made in India', but we see some force in the contention of the Indian producers that the absence of a label to the effect that the Eveready cell is made in India may give the impression that it is made in America and may in that way give an advantage to the National Carbon Company's product, though ultimately it is the quality that must tell. We make no definite recommendation in this behalf, but bring this fact to the notice of Government with a view to examination of the complaint in the appropriate Department.

Import control.

18. Import of dry cells and batteries is at present controlled by the Central Government. Licences for import are given only to the extent the imports may be necessary to relieve the shortage in the country. Now that we have recommended that the industry should be protected by means of a suitable protective duty, thereby reducing the possibility of the Indian producer from being under-sold by imports, there should be no need to continue import control. We, therefore, recommend that, with effect from the time action is taken on our recommendations for the protection of the dry battery industry, import control on this commodity should be lifted, unless it is found that its continuance is necessary for other reasons, such as conservation of foreign exchange. The industry would like import control to continue as a form of assistance to the industry, but appreciated that this could not be justified after the imposition of protective duties and when provision has been made to raise the duty in the event of a fall in the c.i.f. price so as to maintain the measure of protection.

19. (a) Both the conditions prescribed for eligibility of an industry for protection are fulfilled in the present case. Even after leaving aside the National Carbon Company, which is the biggest producer of dry batteries in India, it can be said that the industry is run on sound business lines. Estrelas, who are the applicants in the case, have been in this line for a number of years and did very valuable work in wartime. They have set up a new factory with the encouragement of Government where up-to-date and automatic machinery imported from U.S.A. has been installed with capacity for a large output. Installation of new machinery with a view to minimising manual labour and improving the quality of the product is going on. The firm has secured the services of an American production engineer and a British chemist on contract basis. As for the second condition, *i.e.*, the industry must enjoy natural advantages in regard to raw materials, markets, and eventual costs, it may be said that the industry is favourably situated in respect of both markets and cost of production. There is a large internal market to which the industry can cater and there is scope for export to the adjoining countries. With a rise in the standard of living, the home demand for torch cells is bound to increase, thus ensuring stability to the Indian industry. The fact that during the war a completely new plant had to be set up to supply the requirements of Government speaks of its importance in national economy. It is true that at present many of the raw materials have to be imported ; but, as stated in the paragraph dealing with raw materials, this difficulty is likely to be gradually overcome with further development in research and experiments on the Indian materials. A beginning has already been made with manganese dioxide, an important raw material, as may be seen from the experience of Baroda Batteries. We, therefore, come to the conclusion that the industry has established its eligibility for protection.

Eligibility for protection

(b) One of the points urged against the eligibility of Estrelas for protection was that the firm was using the shortage in dry cells to push forward the sale of its imported flash lights and some documents were produced in support of this contention. Estrelas explained that some complaints of this nature were received against their sole agents in Bombay province and that they had warned their agents not to indulge in such practice in future. They, however, did not consider this behaviour of their agent as sufficient to justify withdrawal of the agency from him. We were not impressed by the argument of Estrelas that the import and sale of flash lights by them was necessary to reduce their overhead expenditure, particularly when this activity was likely to lead them into a malpractice as mentioned in the written memoranda as well as in the oral evidence of a number of importers and consumers. A firm which comes for protection at the cost of the public must do so with absolutely clean hands and must not give any occasion for others to say that the protection, if granted, would be abused. We have reason to believe that Estrelas have realised this position and hope that they will take every possible action to safeguard themselves from being a target of a similar charge in future. We do not regard this complaint as sufficient to warrant rejection of the claim to protection when it is justified on other grounds.

20. One special feature of this industry to which we must draw the attention of Government is that, of the two principal factories, one—and it is the major one—is an entirely foreign concern and is further a branch of the world-wide combine of the National Carbon Co. which has factories for the production of dry cells and dry batteries in many parts of the world, such as, Australia, South Africa, Indonesia, etc. The Indian branch, which is situated at Calcutta, has the advantage not only of the resources of the parent company but also of the technical skill and experience gathered by the parent company for over a hundred years. Naturally, the cost of production at the National Carbon Company's factory in Calcutta is lower than that of the other battery producers in India ; and that is why that firm said that it was not interested in the application for protection and that, in fact, no protection was needed for the Indian industry. The National Carbon Company refused to allow us to cost their factory, but later gave us information including their cost of production. This co-operation from National Carbon came at a rather late stage of the case when it was not possible to take full advantage of it. We must say in fairness to Mr. Farrel that when he appeared at the public inquiry in response to our special request, he was all out with help and information and that his participation in the public inquiry was of great use to the Board. Ordinarily in determining the measure of protection necessary to safeguard the Indian industry, we take the lowest cost of production of a manufacturer of good or even average efficiency, ignoring both the high cost of smaller manufacturers and the unduly low cost of the biggest manufacturer enjoying certain special advantages which are denied to others. If we had before us the comparative detailed figures of cost of production of both National Carbon and Estrelas, we would have seen where economy could be practised by Estrelas and what should be the lowest cost of production, the idea underlying protection being, firstly, to protect the efficient rather than the inefficient, and, secondly, to protect the Indian industry against external competition rather than internal competition. National Carbon did not place all their cards on the table, and we had therefore no option but to be guided by the cost of production of Estrelas as worked out by our Cost Accounts Officer and modified in the discussion at the public inquiry. It is inevitable that the benefit of such protection as may be given on the basis of cost of production of Estrelas will go to National Carbon with their admittedly lower costs of production, but that is a consequence which could not be helped, in spite of the fact that National Carbon, though having a factory in India, are wholly a non-Indian concern. If we were merely to be guided by the bald statement of National Carbon that their costs of production are lower than the foreign prices and that they do not need any protection for their Indian enterprise, we would have been unfair to Estrelas and done a disservice to an Indian enterprise for no fault of its own. We have made a special mention of this feature of the case as we have departed from our usual practice in taking the cost of production of not the biggest or the most efficient producer but of the second best, and have ignored the contention of the biggest producer that there is no reason why Indian costs should be higher than the foreign prices. We have said in two of our recent reports, on electric motors and

Special feature of the industry.

machine tools, that the work of the Board is handicapped for want of powers enabling it to compel unwilling witnesses to furnish information essential to a proper understanding of the issues involved in a tariff investigation, and this is the third case of its kind leading to the same conclusion. We, therefore, suggest that Government should seriously consider as to how this handicap of the Tariff Board can best be removed.

Burden of protection.

21. As we have recommended grant of protection to the dry battery industry for a period of three years, it is necessary to examine whether the burden of protection will be such as could be borne by the consumers without any untoward consequences. In the first place, although we have recommended imposition of a protective duty, we have not suggested an increase in the rate of duty and there is, therefore, no increase in the burden on the consumers of dry batteries. Secondly, by far the greater percentage of dry batteries are not used as an industrial store, and, therefore, an increase in the prices of dry batteries as a result of protection, which, however, is not likely to happen in this case, cannot be said to be open to objection as it might be if the batteries were used as a raw or semi-raw material in the production of another commodity. The generality of opinion among the consumers who were consulted in regard to the desirability of grant of protection to the industry was that the increased burden, if any, would be accepted by them ungrudgingly in the hope of (a) building up this industry, (b) becoming self-sufficient in the matter of supplies of this commodity, and (c) deriving the benefit of lower prices in due course. The Chicago Telephone and Radio Company Ltd., Bombay, has stated that the new industry should be granted protection by way of an increase in the existing duties, and that such an increase in duty will not affect it industrially as it does not use batteries in any manufacturing processes. The same opinion is expressed by the Association of Indian Industries, Bombay, and by a number of other consumers, to whom our questionnaire intended for consumers was issued, and who cared to send us their replies. The panels for the heavy chemical and electro-chemical industries constituted by the Planning and Development Department of the Government of India considered the case of the dry cells industry and said that in order to safeguard its future, it should be granted protection against foreign competition.

Protection of the industry in Australia.

22. The Australian dry battery industry dates from 1901 and has been protected by means of high tariff duties. There were three tariff enquiries for this industry in 1923, 1933 and 1934. For some time, the duty levied was a specific one, the *ad valorem* equivalent of which varied from 76 per cent. to 250 per cent. on certain popular types of cells and batteries. The duty now in force is, British preferential per lb. 2*d.* or *ad valorem* 25 per cent. and general 5½*d.* or 48¾ per cent. Moreover, the Australian industry has the support of one of the leading manufacturers of dry batteries in the world, *viz.*, the National Carbon Company of U.S.A. Compared with the tariff protection in Australia, our recommendation for a protective duty of 30 per cent. *ad valorem* must be regarded moderate, the credit for which should go to the Indian industry,

which has made such good progress during the short period of its existence, and which hopes to be able to dispense with even this protection by the end of March 1950.

Summary of conclusions and recommendations.

23. Our conclusions and recommendations are summarised as under :—

(1) The dry battery industry was first established in the country in 1926, and the two main producers today are the National Carbon Co. Ltd., Calcutta, and the Estrela Batteries Ltd., Bombay. The magnitude of the industry can be judged from the capital employed, *viz.*, Rs. 88 lakhs approximately, the value of production per year amounting to approximately 180 lakhs, and the employment of 2,560 workers. (Paragraph 4).

(2) A dry cell comprises mainly three components in the manufacture of which both indigenous and imported raw materials are employed. The percentage of value of indigenous and imported raw materials works out roughly as 22 per cent. and 78 per cent., respectively. (Paragraph 6).

(3) The total prewar Indian demand was about 40 million cells per annum ; the future demand is estimated at 150 million cells per year, valued at about Rs. 259 lakhs, by the end of 1950. (Paragraph 8).

(4) The total prewar domestic capacity was about 18 million cells per year. It is at present 132 million cells and is expected to rise to 142 million cells by the end of 1947, and to 185 million cells by the end of 1948 (Paragraph 9).

(5) The quality of the indigenous product is on the whole as good as that of the imported cells (Paragraph 10).

(6) The fair selling price of 1,000 standard cells, for the purpose of determining the measure of protection is estimated at Rs. 230.25. (Paragraph 11(f).).

(7) U.S.A. is considered to be our principal competing country in this trade (Paragraph 12).

(8) The present average c.i.f. price of 1,000 standard cells comes to Rs. 187.50 and the landed cost to Rs. 248.75 (Paragraph 14 (c)).

(9) The industry should be protected for the period ending March 1950. The existing 30 per cent. *ad valorem* revenue duty should be converted to an equivalent *ad valorem* protective duty valid upto end of March 1949. The cost of Estrelas should be reviewed early in 1949 to determine what the rate of duty should be for the remainder of the period of protection, *i.e.*, for 1949-1950. We expect that neither Estrelas nor National Carbon will take advantage of the 30 per cent. protective duty and raise their prices (Paragraph 16(a)).

(10) In the event of the c.i.f. price falling below Rs. 173 per 1,000 standard cells, the duty should be reviewed under Section 4(1) of the Indian Tariff Act so as to raise the total landed cost to Rs. 230 in order to maintain the measure of protection (Paragraph 16(b)).

(11) We did not find any special grounds for remission of duty on certain raw materials which are at present imported in this case. (Paragraph 17(a)).

(12) The customs duty, which is at present 10 per cent., on battery manufacturing machinery paid in respect of such imports hereafter should be refunded (Paragraph 17(b)).

(13) The dry battery producers should form an Association with a view to joint encouragement of research in this industry. There should be better liaison between the industry and the Council of Scientific and Industrial Research (Paragraph 17(d)).

(14) Government should examine the industry's request that National Carbon should be asked to print 'Made in India' on the labels of their Calcutta factory products sold in India (Paragraph 17 (e)).

(15) All import control on this commodity should be lifted, unless its retention is considered necessary for other reasons, such as, conservation of foreign exchange (Paragraph 18).

(16) The industry has established its eligibility for protection. (Paragraph 19).

24. The Board wishes to express its thanks to Dr. P. K. Kapre of the Departemnt of Industries and Supplies, Mr. G. D. Joglekar of the Council of Scientific and Industrial Research, and Mr. M. Ahmadullah, Secretary, Mr. Raghava Rao, Cost Accounts Officer, and Mr. Sunawala, Technical Adviser attached to the Board, for their help and co-operation in the investigation.

Acknowledgments.

SHANMUKHAM CHETTY, *President.*

C. C. DESAI, *Member.*

NAZIR AHMAD, *Member.*

AHMADULLAH, *Secretary.*

OOTACAMUND,
Dated the 16th June 1947.

APPENDIX I. (*vide* paragraph 3).

List of firms, associations and persons to whom detailed questionnaires were issued and who replied to the questionnaires. (Those who replied to our questionaire are marked with asterisks.)

Producers.

*1. Estrela Batteries Limited, Yusuf Building, Churchgate Street, Bombay.
*2. The Baroda Batteries Limited, Goya Gate, Baroda.
3. Amco Limited, Chowpatty, Bombay.
4. The Standard Batteries, Limited, Vakola, Santacruz. Bombay.
5. Jamestone Engineering Co. Ltd., Fuller Road, Bombay.
6. National Carbon Co. (India) Ltd., 28, Pollock Street, Calcutta.
7. Kaycee Industries Limited, The Mall, Lahore.

Importers.

1. Bombay Stove and Hardware Depot, T. G. Shah Building, Pydhoni, Bombay.
*2. Messrs. Kasamali Co., Bunder Street, Madras.
*3. Messrs. Dodge & Seymour (India) Ltd., Laxmi Building, Ballard Road, Bombay.
*4. Imperial Electric Mart, Sadar, Delhi.
*5. Chicago Telephone & Radio Co. Ltd., 127, Mahtama Gandhi Road, Fort, Bombay.
*6. Messrs. Jivraj & Sons, Vithal Sayana Building, Lohar Chawl, Bombay.
*7. Messrs. Sarabhai & Co., Western India House, Sir Pherozshah Mehta Road, Bombay.
*8. Karachi Flashlight Dealers' Association, Marriot Road, Karachi.
9. The Royal Electric Co., 193, Princess Street, Bombay.
10. Bhailal G. Patel, 188|189, China Bazar Street, Calcutta.

Consumers.

*1. Chicago Telephone & Radio Co. Ltd., 127, Mahatama Gandhi Road, Fort, Bombay.
*2. Eastern Lights Co., 78, Lohar Chawl, Bombay 2.
*3. The Royal Electric Co., 193, Princess Street, Bombay.
4. Messrs. Turner Morrison & Co., Ltd., 16, Bank Street, Bombay.
5. The Gujerat Battery, Auto Electric Service, Ahmedabad.

Associations and Others.

1. Association of Indian Industries, Industrial Building, Churchgate Station, Bombay.
2. All Chambers of Commerce.
3. All Provincial Directors of Industries.

APPENDIX II—(*vide* paragraph 3).

List of persons who attended the public hearing on the 9th and 10th June 1947.

Producers.

Mr. R. V. Farrell. Representing National Carbon Co. (India), Ltd., 28, Pollock Street, Calcutta.

Mr. H. N. Doshi, Representing Estrela Batteries Ltd., Yusuf Building, Churchgate Street, Bombay.

Mr. A. Bose, Representing Ameo Ltd., Meher Bldg., Chowpatty, Bombay.

Importers.

Mr. Manilal Shah, Representing Bombay Stove & Hardware Depot, Pydhonie, Bombay 3.

Seth Kasamali, Representing Kasamali Company, Bunder Street, Madras.

Mr. Jivraj A. Sanghavi, Representing Jivraj & Sons Vithal Sayana Building, Lohar Chawl, Bombay.

Officials.

Dr. P. K. Kapre, Deputy Development Officer (General & Electrical) Directorate-General of Industries & Supplies, New Delhi.

Mr. G. D. Joglekar, Research Officer. Council of Scientific & Industrial Research, New Delhi.

Associations.

Dr. I. C. Jariwala, (came on 13-6-1947) Association of Indian Industries, Bombay.

APPENDIX III.

Producers of dry batteries, their production capacity and actual output (in terms of cells) (*vide* para. 4).

Name of the producers.	Location of factory.	Productive capacity.	Actual annual output.	Remarks.
1. National Carbon Co. (India) Ltd., Calcutta	5, Rustomjee Parsi Road, Cossipore, Calcutta.	100 millions ..	1946-47 ; 71·4 millions.	
2. Estrela Batteries Ltd., Bombay	Dhaavi Road, Matunga Bombay.	30 millions ..	1944-45 ; 26 ,, 1945-46 : 17 ,, 1946-47 : 16·2 ,,	
3. Baroda Batteries, Ltd., Baroda	Factory Area, Goya Gate, Baroda.	2 millions ..	1946-47 : 320,000	
4. Anco Limited, Bombay	Mysore Road, Bangalore	2 millions ..	1938-39 : 104,889 .. 1939-40 : 179,659	Stopped production since 1942, but likely to re-commence in the year 1948.
5. Jamestone Engineering, Co. Ltd., Bombay	Bhandup, Bombay ..	15 millions ..	....	Production may commence in 1948.
6. Kaycee Industries, Ltd., Lahore	Lahore	5 millions ..	....	At present in experimental stage only but expected to go into production in 1948.

APPENDIX IV (a). (*Vide* Paragraph 12.).

Statement showing the value of imports of Batteries (for Flash Lamps) by sea into British India from principal countries of consignment since 1937-38.

—	Unit	37-38	38-39	39-40	40-41	41-42	42-43	43-44	'44-45	45-46
VALUE OF IMPORTS FROM										
1. U. K.	Rs. (Lakhs)	0·13	0·29	0·26	0·29	0·13	0·07	0·04	Information not available.	
2. Hongkong	Do.	0·95	1·21	0·51	0·45	0·17	0·07	..	Do.	
3. Denmark	Do.	..	0·91	0·23	0·06	..	..	..	Do.	
4. Germany	Do.	4·20	3·31	1·36	..	..	..	..	Do.	
5. Japan	Do.	0·71	0·03	0·08	0·11	..	..	..	Do.	
6. China	Do.	0·37	0·84	0·35	0·25	0·04	..	..	Do.	
7. U. S. A.	Do.	15·39	13·81	19·00	6·58	0·11	0·08	..	Do.	
8. Other countries	Do.	0·37	0·08	0·04	0·03	0·01	..	..	Do.	
Total value of imports ..	Do.	22·12	19·58	21·83	7·77	0·46	0·22	0·04	0·17	0·68

APPENDIX IV(b)—(*vide* paragraph 12).

Statement showing the value of imports of Batteries (other sorts) by sea into British India from principal countries of consignment since 1937-38.

—	—	37-38	38-39	39-40	40-41	41-42	42-43	43-44	44-45	45-46
VALUE OF IMPORTS FROM										
1 U.K.	Rs. (Lakhs)	1·14	0·83	0·40	0·63	0·51	3·98	0·70	Information not available.	
2. Germany . ..	Do.	0·21	0·46	0·05	..	..	..	..	Do.	
3. U. S. A.	Do.	1·53	0·54	0·46	0·28	0·61	1·17	0·94	Do.	
4. Other countries	Do.	0·21	0·11	0·07	0·19	0·02	..	0·02	Do.	
Total value of imports ..	Do.	3·09	1·94	0·98	1·10	1·14	5·15	1·66	2·90	4·44

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